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**The Decrease of Mass Appeal:
How Transformation and Technology Have Changed the Principles of War**

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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09 February 2004

Abstract

THE DECREASE OF MASS APPEAL: HOW TRANSFORMATION AND TECHNOLOGY HAVE CHANGED THE PRINCIPLES OF WAR

Valid, current, and relevant principles of war are imperative to the employment of combat force. Principles of war reside at the core of our military doctrine. Military doctrine directly impacts training methods. Training develops the tactics, techniques, and procedures which are utilized to engage in combat operations. The military professional must maintain an inherent belief and trust in the guiding truths which directly shape the methods in which combat force is employed. Technological advances and transformation have significantly changed the contemporary principles of war. The fundamental maxims culled by centuries of military philosophers and commanders to serve as rules of thumb are not immutable. The current principles are no longer adequate to steer future generations of combat leaders on the quest for victory.

Utilizing the principle of mass as an illustrative example, this paper will show how emergent technology and the move to transform the United States armed forces for the future subsequently results in the requirement to transform the principles of war. This paper will focus on the need for a neoteric restatement of the principles of war - once considered to be immutable - as opposed to a simple refinement of the definitions.

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Introduction

The principles of war are the heuristics of combat force employment.¹ They are the fundamental truths culled by centuries of military philosophers and commanders to serve as rules of thumb or guiding principles to steer future generations of combat leaders to success in war. The principles serve as a ready-made checklist, offering solutions to the numerous complexities of engaging in warfare. The pursuit to distill warfare to its underlying precepts is equivalent to the quest for victory.²

With the approaching conclusion of the second conflict of the 21st century, it is imperative that the principles of war be re-examined and reassessed to determine currency, validity, and relevance. The incitation for the transformation of the military and the revolution in military affairs spawned by technological advances have drastically changed the modernly accepted principles of war. For the war fighter, belief and trust in the principles of war directly shapes the methods by which combat force is employed. The principles of war shape military doctrine. Military doctrine directly impacts training methods. Training develops the tactics, techniques, and procedures that are utilized to engage in combat operations.

Utilizing the principle of mass as an illustrative example, this paper will show how emergent technology and the move to transform the United States armed forces for the future subsequently results in the requirement to transform the principles of war. This paper will focus on the need for a neoteric restatement of the principles of war - once considered to be immutable - as opposed to a simple refinement of the definitions.

History of the Principles of War

The principles of war are the generally accepted fundamental truths which pertain to the practice of war.³ In *Masters of War*, Michael Handel states, “Those seeking to extract simple, unalterable, and universally applicable scientific principles from the complexity of war are bound to be disappointed when they encounter its inevitable paradoxes, contradictions, and tensions.”⁴ Although immutable scientific truths have proven to be elusive, throughout history practitioners in the art of war have developed through analysis, logic, and the study of past successes and failures a compilation of fundamental truths.⁵ As one investigates the relevance of the current principles, it is important to possess an understanding of their origins.

Sun Tzu, author of the treatise *The Art of War* which was written in China during the 4th century BCE, listed five fundamental factors which dealt with the art of war: moral influence, weather, terrain, command, and doctrine.⁶ A careful study of Sun Tzu led military scholars to extract many other truisms that have been pointed out as precursors to the modern principles. Sun Tzu’s work first gained widespread Western attention in 1772 following its first translation into French.⁷

During the 18th century, Frederick the Great possessed an understanding of the different levels of warfare and was cognizant that the professional military education of officers was unsatisfactory.⁸ Following the Prussian defeat of the Austrians in 1745, Frederick transcribed his experiences from the first two Silesian Wars into the *Principes Genereaux de la Guerre*.⁹ This work, which was considered to have given rise to the Prussian analytical system of warfare, contained both a general philosophical discussion of warfare and specified instructions on the details of battle.¹⁰

Specific codified principles of war are generally attributed to Carl von Clausewitz. Clausewitz observed the ruinous, brute power that Napoleon's armies and the revolutionary theory of *levee en masse* unleashed upon the European continent.¹¹ His observations were enunciated in his 1832 analytical, systematic study of warfare, *On War*, which became the military professional's most venerated study of the theory and practice of warfare. Writing as a contemporary of Clausewitz, Henri de Jomini stated that "methods change, but the principles are unchanging" and gave rise to the thought that the principles of war were "independent of the arms employed, of times, and of places."¹² As the 19th century closed, the theory of a body of fundamental precepts which guided the practice of the art of war was generally accepted.¹³

J.F.C. Fuller is considered to have fathered the forerunner to the adaptations of nine principles of war that exist in United States military doctrine today.¹⁴ In the May

***J.F.C. Fuller,
"STRATEGICAL PRINCIPLES", 1916***

These fundamental principles are:

1. The principle of the objective.
2. The principle of the offensive.
3. The principle of mass.
4. The principle of economy of force.
5. The principle of movement.
6. The principle of surprise.
7. The principle of security.
8. The principle of co-operation.

- [J.F.C. Fuller], "The Principles of War, with Reference to the Campaigns of 1914-1915," *Journal of the Royal United Service Institution* 61 (February 1916):3.

***UNITED STATES ARMY,
"THE PRINCIPLES OF WAR", 1921***

The following are fundamental principles of war:

1. The Principle of the Objective.
2. The Principle of the Offensive.
3. The Principle of Mass.
4. The Principle of Economy of Force.
5. The Principle of Movement.
6. The Principle of Surprise.
7. The Principle of Security.
8. The Principle of Simplicity.
9. The Principle of Cooperation.

- United States War Department, TR 10-5, *Doctrines, Principles, and Methods*, 1921, pp.1-2.

***Joint Chiefs of Staff,
"PRINCIPLES OF WAR"***

The principles of war guide warfighting at the strategic, operational, and tactical levels. They are the enduring bedrock of US military doctrine.

1. Objective.
2. Offensive.
3. Mass.
4. Economy of Force.
5. Maneuver.
6. Unity of Command.
7. Security.
8. Surprise.
9. Simplicity

- Joint Publication 3-0, *Doctrine for Joint Operations*, Appendix A.

***Figure 1 : Evolution of United States
Principles of War***

John I. Alger. *The Quest for Victory: The History of the Principles of War*

1955 issue of *Military Review*, General Fuller recounted reading in a British Armed Services Field Regulation manual that “the fundamental principles of war are neither very numerous, nor in themselves very abstruse” but he had futilely searched for them.¹⁵ Inspired by the thought of substantive fundamental principles, Fuller’s Strategical Principles, which first appeared in 1916, were the precursor to the United States Army’s Principles of War which first appeared in War Department Training Regulation 10-5 in 1921.¹⁶ While minor adjustments have been made over the years, it is notable that the Principles have remained relatively unchanged throughout the 20th and into the 21st century.

Importance of the Principles of War and the Shaping of Military Doctrine

The principles of war maintain considerable importance to the modern military professional. The principles are a historical distillation of lessons learned to serve as a guiding volume of knowledge to the operational art of combat force employment. The principles of war serve as a method of short-hand: simplistic words or phrases which convey a substantial volume of thought and shared understanding.¹⁷ They allow the operational commander to usefully organize his own experience with the vicarious experience gained from centuries of study of the art of war.¹⁸

The principles of war, a complex distillation and abstraction of military history, comprise the foundation of military doctrine.¹⁹ The *Department of Defense Dictionary of Military and Associated Terms*, Joint Pub 1-02, offers the official definition of doctrine as “fundamental principles by which the military forces or elements thereof guide their actions in support of national objectives. It is authoritative but requires judgment in application.”²⁰

Simply defined, doctrine is that which is taught within a group as its corporate beliefs, principles, and faith.²¹ Doctrine serves as an accepted set of principles and methods to provide the military organizations with a shared outlook and a uniform basis for action.²²

Military doctrine and the principles upon which it is based serve to shape the very core of the military. Modern military doctrine is notably technocratic, a reflection of the prodigious influence of technology on combat methodology and the belief in a scientific foundation for doctrine, usually expressed in terms of principles of war.²³ Military doctrine affects the employment of operational forces, training, planning, and acquisition; additionally, it influences tactics, techniques and procedures, rules of engagement, training and education, organization and force structure, analysis, programming, campaign planning, strategy and policy.²⁴ The operational commander must have a thorough understanding of the principles of war and military doctrine to effectively lead and employ the military forces under his command. Human nature would elect that the principles of war and the military doctrine that they construct remain immutable, which would be an exorbitant fallacy.²⁵ In order to sustain currency, relevance, and power, our principles and doctrine must maintain a firm foundation in, and be built upon, current technological and theoretical constructs.

The Principle of Mass

The changing nature and methodology of warfare challenges the applicability of the principles of war. The transfiguration of the principle of mass warrants robust contemplation. Mass as a principle is a monumental anachronism which modern warfare requires be forsaken.²⁶ Mass is perhaps the most oft misunderstood principle of war, as a result of both its origin and its definition.

The origin of the concept of mass underlies the misunderstanding of mass as a modern principle of war. The principle of mass derives from the principle of concentration of force(s). The principle of concentration can be recognized as the linchpin to Clausewitz's operational theory of war.²⁷

The best strategy is always to be very strong; first in general and then at the decisive point. Apart from the effort needed to create military strength which does not emanate from the general, there is no higher and simpler law of strategy than that of keeping one's forces concentrated...We hold fast to this principle and regard it as a reliable guide. (Clausewitz, *On War*, 204)²⁸

It thus follows that as many troops as possible should be brought into the engagement at the decisive point...This is the first principle of strategy. (Clausewitz, *On War*, 195)²⁹

If one is genuinely convinced that a great deal can be achieved by a significant superiority, this conviction is bound to influence the preparation for war. The aim will then be to take the field in the greatest possible strength... (Clausewitz, *On War*, 196)³⁰

The first rule, therefore, should be: put the largest possible army into the field. This may sound a platitude but in reality it is not. (Clausewitz, *On War*, 195)³¹

It is clearly evident that the principle of concentration through numerical superiority was highly regarded by Clausewitz. When Clausewitz developed his theories in regards to combat force employment, it was believed that with all aspects of the army being equal – quality of weapons, forces, and leadership—the army which took to the battlefield in superior numbers would always emerge victorious.³²

The warfare methods of 19th century European land combat predicated the reliance upon mass. Mass provided lethality, mitigated uncertainty, supplanted the lack of mobility, and improved command and control. The technological limitations imposed upon warfare up until the 19th century required reliance upon mass. The limited ranges, accuracy, lethality and direct-fire nature of the combat instruments of the era—the smooth bore musket and

cannon—meant that each soldier on the battlefield was on average able to kill fewer than one of his enemy in combat.³³ The concentration of forces mitigated the limited combat effectiveness of the weapons by sending a concentrated volley of firepower toward the enemy. Warfare methods of the era were decidedly symmetric. With the quality of weapons and forces being equivalent for combative forces, the possibility of an inspired leader displaying Clausewitzian *coup d'oeil* or intuition, the utilization of innovative tactics, or the possession of superior morale by one force introduced uncertainty to the conditions of the battle. Numerical superiority functioned as protection against uncertainty, military forces compensated for the unknown through mass.³⁴ The maneuver restrictions imposed upon the armies of the Industrial Age, due to primitive modes of transportation and inefficient lines of communication, increased the commander's reliance upon mass. Lacking sufficient mobility to outmaneuver an equivocal enemy force, the commander required the advantage afforded by mass to fix the enemy in place and utilized numerical superiority to overwhelm and envelop the enemy on the flanks.³⁵ The military commander of the Industrial Age also lacked plentiful methods to communicate with his forces. The battlefield commander maintained his situational awareness by remaining in close proximity to the combat arena. Concentration of force afforded the commander personal involvement, face to face interaction with subordinate commanders, and provided facilitation of command and control; it was easier to control the army if the forces were within visual or shouting range.³⁶

The quantitative element of mass gained additional influence during World War II with the introduction of the Lanchester equations, providing a mathematical, scientific basis for the concept of mass warfare.³⁷

Lanchester's Linear Law (Applicable to Indirect Fire Battles) – To ensure success in battle, a military force must possess twice the number of weapons as the enemy, or the quality of the weapons must be twice as good.³⁸

Lanchester's Square Law (Applicable to Direct Fire Battles) – To ensure success in battle, a military force must possess four times the number of weapons as the enemy, or the quality of the weapons must be four times as good.³⁹

The modern derivative of these equations is the theory currently held by and taught to operational leaders and planners: To ensure success, an attacking force must have a 3:1 numerical advantage over the enemy, a ratio which elevates to 6:1 in difficult terrain such as urban environments.⁴⁰

The principle of mass has evolved since the Napoleonic era. However, to many students of military theory, mass remains related to quantitative superiority of weapons and forces. As warfare methods changed, it became necessary to change and adapt the principles of war. Adaptations to the principles were required to maintain the currency of the principles with respect to military doctrinal changes, advances in technology, adversarial adaptation to tactics, techniques and procedures, increased study and knowledge of military theory, and changes in national strategy.⁴¹

The *Department of Defense Dictionary of Military and Associated Terms*, Joint Pub 1-02, offers the official definition of mass as “1. The concentration of combat power. 2. The military formation in which units are spaced at less than the normal distances and intervals.”⁴² The *Doctrine for Joint Operations*, Joint Pub 3-0, provides the official definition of mass as a principle of war:

“The purpose of mass is to concentrate the effects of combat power at the most advantageous place and time to achieve decisive results. To achieve mass is to synchronize and/or integrate appropriate joint force capabilities where they will have a decisive effect in a short period of time. Mass often must be sustained to have the desired effect. Massing effects, rather than

concentrating forces, can enable even numerically inferior forces to achieve decisive results and minimize human losses and waste of resources.”⁴³

The official definitions of mass introduce additional confusion to the understanding of the principle of mass. Mass is in one definition a “concentration of power” while in another it is a “concentration of effects.”

ADM Arthur K. Cebrowski, former President of the U.S. Naval War College, stated “The whole concept of mass is now defunct for the purpose of foreign wars.”⁴⁴ The advance of technology and the revolution in military affairs that it incited-dubbed transformation-have once again called into question the veracity of mass as a principle of war.

Technology – Evolution of the Principle of Mass

Modern technology has decreased the requirement for and the reliance upon mass. Robert Kaplan stated, “While the average engagement during the Civil War featured 26,000 men per square mile of battlefield, the figure is now 240...it will dwindle further as war becomes increasingly unconventional and less dependent upon manpower.”⁴⁵ The tenets of the new technological method of warfare are increased speed, range, precision, survivability, timely intelligence, and improved command and control.⁴⁶ Technology has improved the precision and lethality of modern weapon systems. The requirement for mass based upon the theory of one shot equals one or less kills is no longer relevant. Modern technology has enabled a single weapon system to engage multiple targets with one shot, employ multiple shots in rapid succession, and to engage multiple, displaced targets with multiple weapons from a single release point.⁴⁷

The advent of precision and accurate

<u>Operation</u>	<u>% Smart Weapons Utilized</u>
DESERT STORM	9 %
ALLIED FORCE	29 %
ENDURING FREEDOM	60 to 70 %
IRAQI FREEDOM	68 %(at the end of April 2003)

Table 1: Percentage of Smart Weapons Utilized of Total Weapons Expended During Recent Combat Operations

weapons is the most commonly cited affront to the principle of mass. During World War II, the Allies' average allocation of weapons to target was approximately 600 bombs per target.⁴⁸ The technological evolution of air-to-ground weapons now allows that same target to be destroyed by a single weapon. Recent combat operations have demonstrated an increasing reliance upon precision guided munitions. (Reference Table 1.⁴⁹) The precision revolution began with the introduction of precision-guided munitions (PGMs) (or laser-guided bombs (LGBs)). Assuming satisfactory guidance, an LGB will strike within its specified circular error probable (CEP) of 3 meters relative to the designated target. Instead of calculating the number of bombs or number of attacks required to destroy a target, the dominant theory has become one bomb, one pass, one target.

The most important technological development in the evolution of *precision strike* is the introduction of accurate weapons - Global Positioning System (GPS) Guided Weapons (GGWs). GGWs provide an all-weather, launch-and-forget capability. The most prominent GGW in aviation strike warfare is the Joint Direct Attack Munition (JDAM). The JDAM is capable of receiving positional location and guidance information from the GPS constellation of satellites and can strike a target 10-30 km from its release point, increasing stand-off from the target area and survivability of the delivery platform. Assuming satisfactory GPS guidance and updates, a JDAM will strike within its specified circular error probable (CEP) of 13 meters relative to the target. Employing multiple JDAM releases, a single aircraft can strike multiple targets in a single pass from a single release point.

The United States military demonstrates an increasing reliance upon GPS guided stand-off weapons to combine precision, lethality, and survivability. (Reference Table 2.⁵⁰)

Smart stand-off weapons allow the military to concentrate combat power in the desired target area, while utilizing a minimal number of launch/release platforms from distant and dispersed locations. The utilization of modern technology, in the form of precision/accurate weapons, allows the improved speed, range, precision, and lethality of modern weapons to replace the requirement for massed numbers or effects.

Modern advances in the field of information technology have significantly impacted the requirement for mass. While mass once afforded the operational commander the ability to maintain his situational awareness and increase the capability for command and control by maintaining close proximity to the battlefield, technology negates this requirement. The use of linked tactical computers, GPS

position locaters, and secure digital communications allows the operational combat commander to digitally maintain a situational picture many times without being in the same geostrategic theater.⁵¹ The utilization of the nonclassified and secret Internet protocol router networks (NIPRNet / SIPRNet) allows widely dispersed commanders

- Joint-Air-to-Surface Stand-off Missile (JASSM) with a range of over 300 km.
- Navy's Stand-off Land Attack Missile-Expanded Range (SLAM-ER) with over 250 km effective range and automated target recognition (ATR).
- Joint Stand-Off Weapon (JSOW) with a glide range of 70-80 km when launched from high altitude.
- Navy's Tomahawk Land Attack Missile (TLAM) which provides long range sea-based precision-strike, with a range over 1,800 km.
- Conventional Air-Launched Cruise Missiles (CALCMs) and Extended Range Cruise Missiles (ERCMs) with ranges of over 1200km and 1800km, respectively.
- Army Tactical Missile System (ATACMS) with ranges between 130-200 km.
- Long-endurance, unmanned combat vehicles (UCAVs) that can conduct precision strike on fixed and mobile ground targets.

Table 2: U.S. Current and Emergent Smart, Stand-off Weapons Inventory

and operators to conduct real time communication, conduct operational planning, share intelligence, and make rapid real time assessments of combat operations. Modern informational technology removes the need for mass-based command and control. The

modern digital architecture of command and control allows the military to operate and communicate in real- or near real-time to attack the enemy from widely dispersed, non-collocated positions in a patternless manner, diminishing the requirement for mass.⁵²

Transformation – Revolution of the Principle of Mass

Transformation has been variously called an ethereal concept, a buzzword, and a revolution in military affairs. Regardless of interpretation, the transformation of the military has irrevocably changed the requirement for the principle of mass. The Secretary of Defense's "Transformation Study Report" defines transformation as "changes in the concepts, organization, process, technology application and equipment through which significant gains in operational effectiveness, operating efficiencies and/or cost reductions are achieved."⁵³ While transformation is rooted in technology, Secretary of Defense Donald Rumsfeld said that transformation shows that "a revolution in military affairs is about more than building new high-tech weapons...It's also about new ways of thinking, and new ways of fighting."⁵⁴ Transformation is about technological, intellectual, and cultural changes to the military and requires resultant changes in our principles and doctrine.

Building upon the base tenets of precision, information management, communications and stealth, transformation warfare theory constructs an integrated, synergistic system of systems to focus combat power in order to create devastating effects which will cripple the enemy so that conflicts can be won rapidly, with decreased mass, without having to engage in long and destructive conflicts of attrition.⁵⁵ Transformation theory allows for geographic and organizational decentralization and dispersal of forces and functions.⁵⁶ It utilizes information technology, improved sensor systems, and smart weapons to achieve distant action against dispersed targets, over wider geographic areas, with rapid

succession or simultaneity while decreasing the requirement to numerically and physically mass forces.⁵⁷ An effective method to contrast the transformational theory of warfare with the previously existing theory based upon mass is to utilize the table from Harlan Ulman's

	<i>Transformation</i>	<i>Mass</i>
Elements	Rapid Dominance (New Doctrine)	Decisive Force (Old Doctrine)
Objective	Control the adversary's will, perceptions, and understanding	Prevail militarily and decisively against a set of opposing capabilities
Use of Force	Control the adversary's will, perceptions, and understanding and literally make an adversary impotent to act or react	Unquestioned ability to prevail militarily over an opponent's forces and based against the adversary's capabilities
Force Size	Could be smaller than opposition, but with decided edge in technology, training, and technique	Large, highly trained, and well equipped; materially overwhelming
Scope	All encompassing	Force against forces and supporting capability
Speed	Essential	Desirable
Casualties	Could be relatively few on both sides	Potentially higher on both sides
Technique	Paralyze, shock, unnerve, deny, destroy	Systematic destruction of military capability; attrition applicable in some situations.

Table 3: Key Differences between Transformation and Mass

and James Wade's *Shock and Awe* (Table 3).⁵⁸ The resultant combination of speed, agility, maneuverability, flexibility, surprise, increased range and survivability, improved command and control and timely intelligence that is derived from the new transformational theory of warfare translates into decisive combat power, and replaces the requirement for mass.⁵⁹ A guiding characteristic for the concept of decisive combat power would be the Royal Canadian Mounted Police principle: "Never put a man where you can put a bullet."⁶⁰

The Current Relevance of Mass – Flawed Assumptions

Modern proponents of the abiding relevance of mass as a principle of war have grounded their arguments with flawed assumptions. Supporters of mass have argued that recent combat operations have shown that the nature of warfare has not significantly changed

and that the fundamental principle of mass which has guided the military to success in the past remains viable to current and future operations. Proposing that the military should proceed “forward with fundamentals,” proponents of mass have argued that when the military commanders committed a force possessing commensurate numbers and firepower to subjugate the opposition, superlative results were achieved.⁶¹ “Squads of armchair generals”, the vocal pundits of the existent relevance of mass, have argued that the deployment of forces in support of recent combat operations “is too small and too light” and that it does not satisfy the Powell doctrine calling for overwhelming force.⁶² The major infirmity in these arguments is that they possess the flawed quantitative interpretation of the principle of mass and fail to exhibit an understanding of the principle as currently defined.

Modern proponents of the principle of mass with a clearer understanding of the current definition of mass refer to the “massing of effects.” The concept of “massed effects” is vague, pedantic, and lacks applicability.⁶³ As originally quantitatively defined, a derivative of the principle of the concentration of force(s), the principle of mass was an effective fundamental governing *means* to achieve the object conquest of the enemy.⁶⁴ Mass, as currently defined in reference to massed effects, is no longer a *means* but has become an objective all to itself.⁶⁵ Asking the modern operational artist to “mass effects” simply refers to a desired objective outcome but offers no germane instrumentation by which to achieve the purpose. The modern proponents of mass as an enduring principle of war demonstrate that mass continues to be vastly misunderstood, both as a result of historic origin and dubious definition.

The Emergent Principle of Power

The combat operations of the 21st century demonstrate that the principle of mass is no longer pertinent to modern warfare. Deficient of valid interpretation and definition, it is time for mass to be discarded as a principle of war. The “Principle of Power” has emerged as a resonant successor to the principle of mass. The principle of power can be defined as the focused concentration of combat capabilities in space and time to obtain overwhelming decisive debilitating effects on the enemy in support of the overall objective through the synergistic and cumulative application of capabilities, military and non-military, at all levels of the conflict. Power utilizes application of technology, improved sensor and weapon systems, and requisite quantitative force to achieve resultant effects across the full spectrum of operations. Power allows for action against targets, with rapid succession or simultaneity, utilizing precision, speed, agility, maneuverability, flexibility, surprise, and stand-off, while decreasing the requirement to numerically and physically mass forces, in order to achieve decisive results while minimizing the expenditure of human and material resources.

Recent military operations demonstrate the viability and flexibility of the principle of power. In Operation ENDURING FREEDOM, the United States military utilized a masterful application of combat power, comprised of precision firepower, superior information technology, psychological operations, Special Forces and a primitively equipped indigenous force to topple the Taliban and al Queda forces. In Operation IRAQI FREEDOM, in the face of a more robust military force, the application of power by a networked system of forces utilizing precision, maneuver, simultaneity and speed allowed the light, highly mobile forces to defeat a quantitatively superior adversary. Contrary to traditional thinking, through the judicious application of power, the coalition forces defeated

the Iraqi forces while shouldering a 3:1 or 4:1 quantitative disadvantage.⁶⁶ The true operational artistry in the “Shock and Awe” campaign was not its purported capability to incapacitate the leadership of Iraq and extirpate the national will. The monumental artistry was in the bold and innovative, synergistic application of power to concentrate combat capabilities in space and time, to engage multiple dispersed and displaced targets, over a wide geographic area, utilizing simultaneity, precision, speed of execution, and synchronization of coalition ground, naval, air and special force elements.⁶⁷

Principles of Operations - Transforming the Principles of War

“*Bumaga vsyo terpit*”—“paper endures everything” (Old Russian proverb)⁶⁸

As a whole, the military organization is resistant to change. In our traditional military society, ideas, words, doctrines, and principles are enduring. In the shadow of the first major combat operations of the technological era, the existing principles of war have proven to be inadequate and inapplicable to current and future combat operations. In order to ensure the vitality and relevance of a set of fundamental truths to guide the employment of combat force, a robust effort must be initiated through the use of dynamic reason to reassess, rethink, and transform the principles of war to produce principles which are applicable across the full spectrum of military operations. The effort must not result merely in a meager redefinition of the existing terms, but must demonstrate revolutionary and innovative conceptual thought and agitate the contemporary hierarchy. The transformation of the principles should be more than an application of 21st century terms to existing concepts and principles. The development of Evolving Fundamentals of 21st Century Joint Warfare and Crisis Resolution (See Table 4.⁶⁹) is an important initial step in the direction of transforming the principles of war.

A suggested method to effect the transformation of the principles of war would be the institution of an Operational Studies Group, built on a construct similar to the Naval War College's Strategic Studies Group.⁷⁰ The effort to transform the principles of war should be undertaken by joint military operators, military theorists and academic historians, working in conjunction with the Joint Staff, Operational Combatant Commanders, and members of the individual service warfare development and doctrine commands. Military theorists and academic historians will provide important historic, original context to the study of existent

<i>Current Joint Doctrine Principles of War, Principles of MOOTW, and Fundamentals of Joint warfare</i>			<i>Evolving Fundamentals of 21st Century Joint Warfare and Crisis Resolution</i>
<i>Principles of War (JP 1-0 & 3-0)</i>	<i>Principles for MOOTW (JP 3-0 & 3-07)</i>	<i>Fundamentals of Joint Warfare (JP 1-0)</i>	
Objective	Objective		End State
Offensive		Initiative Freedom of Action	Initiative
Mass	Restraint	Concentration	Application of Combat Power
Economy of Force		Extension	
Maneuver			Joint Maneuver Tempo
Unity of Command	Unity of Effort	Unity of Effort	Unity of Effort
Security	Security		Safeguarding the Force
Surprise			Shock
Simplicity		Clarity Knowledge	Understanding
	Perseverance		Will
	Legitimacy		Legitimacy
		Sustainment	Sustainability
		Agility	Adaptability

Table 4

principles, within the U.S. principles of war as well as those which exist in other countries which might be considered for inclusion.⁷¹ This important wealth of knowledge is resident at our nation's service War Colleges. The combatant commanders, as well as the returning battlefield commanders and tactical operators, must be utilized to identify the innate operational requirements that the transformed principles will shape and guide. This will ensure that the new principles will be built with a framework of relevance and currency.

Such input will ensure that the emergent principles will maintain applicability to their primary user, the operator. Due consideration must be given to the individual and joint service strategic visions to ensure that the emergent principles will maintain viability and applicability to the combat capable force of the future. Through concentrated, focused investigation and study, each existing principle should be examined in terms of historic origin, definition, and interpretation and measured for validity, relevance, and applicability to current and future operations. The effort should include the investigation of absent and emergent principles for possible incorporation, for instance morale, will, or simultaneity. In his May 2003 *U.S. Naval Institute Proceedings* article, Dr. Milan Vego states, “Operational lessons learned in peacetime and in combat should be used to refine, modify, or rewrite the existing doctrine. Prevailing assumptions should be openly, continuously, and vigorously challenged.”⁷² Because the principles of war are “the enduring bedrock of U.S. military doctrine,”⁷³ as the definitive lessons learned from the most recent conflicts become more focused and prolific, they must be used as tools to agitate and revolutionize the fundamental thinking upon which our doctrine is based.

The emergent principles of operations should serve as the guiding principles to steer current and future generations of combat leaders to success. The principles must be delineated in clear, unambiguous terms free of historic and definitional misinterpretation. The new principles must remain applicable to each of the joint services. The emergent principles should serve as a guide across the full spectrum of military operations and maintain value to the strategist, the operator, and the tactician. It is requisite that the evolutionary and revolutionary changes in the methods of warfare also be reflected in a transformation of the base maxims that guide our operations.

Conclusion

Valid, current, and relevant principles of war are imperative to the employment of combat force. Principles of war reside at the core of our military doctrine. Military doctrine directly impacts training methods. Training develops the tactics, techniques, and procedures which are utilized to engage in combat operations. The military professional must maintain an inherent belief and trust in the guiding truths which directly shape the methods in which combat force is employed. Technological advances and transformation have significantly changed the contemporary principles of war. The fundamental maxims culled by centuries of military philosophers and commanders to serve as rules of thumb are not immutable. The current principles are no longer adequate to steer future generations of combat leaders on the quest for victory.

Studying the principle of mass, it is evident that the applicability of the currently stated principles of war is challenged by the changing nature and methodology of combat. The current principles of war are burdened by history and misunderstanding. It is time for modern operational artists and commanders to divorce themselves from principles predicated upon the warfare concepts of 19th century European land combat. In the dawn of the 21st century, the principles of war must be re-examined, reassessed, and transformed into the principles of operation to provide currency, validity, and relevance to the joint forces across the full spectrum of military operations.

Notes:

¹ Robert R. Leonhard. *The Principles of War for the Information Age* (Novato, CA: Presidio Press, 1998), ix.

² John I. Alger. *The Quest for Victory: The History of the Principles of War* (Westport, Conn.: Greenwood Press, 1982), xvii.

³ Ibid., 4.

⁴ Michael I. Handel, *Masters of War: Classical Strategic Thought*, 3d rev. and exp. ed., (Portland: Frank Cass Publishers, 2001), 8.

⁵ Alger, 3.

⁶ Christopher Bellamy, “Principles of War,” in *The Oxford Companion to Military History*, ed. Richard Holmes (New York: Oxford University Press, 2001), 737.

⁷ Alger, 4. Alger derives his reference from Appendix III, “Sun Tzu in Western Languages”, in Sun Tzu, *The Art of War*, translated by Samuel B. Griffith

⁸ Vincent Scatamacchia. *Frederick the Great: They Don’t Call Him Great For Nothing*. (Individual Study Project, U.S. Army War College, Carlisle Barracks, PA, 1992), 11, DTIC, AD-A249 356.

⁹ Ibid., 12. This work is more commonly known as *General Principles of War* or *The Instructions of Frederick the Great to His Generals*.

¹⁰ Ibid.

¹¹ RADM John G. Morgan, Dr. Anthony D. McIvor and the Secretary of the Navy’s Action Team. “Rethinking the Principles of War,” *U.S. Naval Institute Proceedings*, October 2003, 34.

¹² Ibid., 35.

¹³ Ibid., 34.

¹⁴ John M. Collins. *Grand Strategy: Principles and Practices* (Annapolis, Maryland: Naval Institute Press, 1973), 22.

¹⁵ Marshall Fallwell. “The Principles of War and the Solution of Military Problems,” *Military Review* 35 (May 1955): 48-62; quoted in Bernard Brodie, “The Worth of Principles of War,” Lecture, U.S. Army Command and General Staff College, Fort Leavenworth, KS: 07 March 1957.

¹⁶ Collins, 22.

¹⁷ Bernard Brodie, “The Worth of Principles of War,” Lecture, U.S. Army Command and General Staff College, Fort Leavenworth, KS: 07 March 1957.

¹⁸ Ibid.

¹⁹ James J. Tritten. “Naval Perspectives on Military Doctrine,” *Naval War College Review* 48, no.2 (Spring 1995): 29.

²⁰ *Department of Defense Dictionary of Military and Associated Terms*, Joint Pub 1-02 (Washington: U.S. Government Printing Office, 12 April 2001 As amended through 05 June 2003.), 165. [Joint Electronic Library CD-ROM] (Washington D.C. : June 2003).

²¹ Wayne P. Hughes, Jr. “The Power in Doctrine,” *Naval War College Review* 48, no.3 (Summer 1995): 14.

²² Daniel Moran. “Military Doctrine,” in *The Oxford Companion to Military History*, ed. Richard Holmes (New York: Oxford University Press, 2001), 262.

²³ Ibid., 263.

²⁴ Tritten, “Naval Perspectives on Military Doctrine,” 31.

²⁵ Tritten, “Naval Perspectives on Military Doctrine,” 30.

²⁶ Leonhard, 94.

²⁷ Handel, 361.

²⁸ Carl von Clausewitz. *On War*. ed. and trans. By Michael Howard and Peter Paret. (Princeton, NJ: Princeton University Press, 1984) 204; quoted in Michael I. Handel, *Masters of War: Classical Strategic Thought*, 3d rev. and exp. ed., (Portland: Frank Cass Publishers, 2001), 362.

²⁹ Carl von Clausewitz. *On War*. ed. and trans. By Michael Howard and Peter Paret. (Princeton, NJ: Princeton University Press, 1984) 204; quoted in Michael I. Handel, *Masters of War: Classical Strategic Thought*, 3d rev. and exp. ed., (Portland: Frank Cass Publishers, 2001), 361.

³⁰ Carl von Clausewitz. *On War*. ed. and trans. By Michael Howard and Peter Paret. (Princeton, NJ: Princeton University Press, 1984) 204; quoted in Marc LeGare, *Mass: Evolving Tool of the U.S. Operational Artist*. (Monograph, School of Advanced Military Studies, U.S. Army Command and General Staff College, Fort Leavenworth, KS, 1993), 1. DTIC, AD-A274 360.

³¹ Carl von Clausewitz. *On War*. ed. and trans. By Michael Howard and Peter Paret. (Princeton, NJ: Princeton University Press, 1984) 204; quoted in Michael I. Handel, *Masters of War: Classical Strategic Thought*, 3d rev. and exp. ed., (Portland: Frank Cass Publishers, 2001), 363.

³² Marc LeGare, *Mass: Evolving Tool of the U.S. Operational Artist*. (Monograph, School of Advanced Military Studies, U.S. Army Command and General Staff College, Fort Leavenworth, KS, 1993),1. DTIC, AD-A274 360.

³³ Leonhard, 98.

³⁴ Ibid., 104.

³⁵ Ibid., 106.

³⁶ Ibid., 110.

³⁷ Ibid., 117.

³⁸ Ibid., 117.

³⁹ Ibid., 117.

⁴⁰ Max Boot. "The New American Way of War," *Foreign Affairs* 82,no.4 (July-August 2003): 44.

⁴¹ Russell W. Glenn. "No More Principles of War?," *Parameters* 28 (Spring 1998): 53.

⁴² *Department of Defense Dictionary of Military and Associated Terms*, Joint Pub 1-02, 322.

⁴³ *Doctrine for Joint Operations*, Joint Publication 3-0 (Washington: U.S. Government Printing Office 10 September 2001), A-1.

⁴⁴ Arthur K. Cebrowski. "President's Forum," *Naval War College Review* 54, no.1 (Winter 2001): 11.

⁴⁵ Robert Kaplan, *Warrior Politics* (New York: Vintage, 2003) quoted in RADM John G. Morgan, Dr. Anthony D. McIvor and the Secretary of the Navy's Action Team. "Rethinking the Principles of War," *U.S. Naval Institute Proceedings*, October 2003, 35.

⁴⁶ William B. Scott. "Iraq Lesson's Learned," *Aviation Week & Space Technology*, 12 May 2003), 38.

⁴⁷ Leonhard, 101.

⁴⁸ Morgan, McIvor and the Secretary of the Navy's Action Team, "Rethinking the Principles of War," 35.

⁴⁹ Eric E. Thiesen. *Ground-Aided Precision Strike : Heavy Bomber Activity in Operation Enduring Freedom*. Air War College Maxwell Paper No. 31 (Maxwell Air Force Base, AL: Air University Press, July 2003), 5 and Bruce Rolfsen. "Air power unleashed : Lessons from Iraq," *Armed Forces Journal*, June 2003, 30.

⁵⁰ Andrew F. Krepenivich Jr. and Robert C. Martinage. *The Transformation of Strategic Strike Operations* (Washington D.C.: Center for Strategic and Budgetary Assessments, March 2001), 22-3.

⁵¹ Leonhard, 112.

⁵² Ibid.,113.

⁵³ Office of the Secretary of Defense, *Transformation Study Report: Transforming Military Operational Capabilities* (Washington, DC: Government Printing Office, April 27, 2001) chart 5. quoted in Hans Binnendijk. *Transforming America's Military*. (Washington D.C.: National Defense University Press, 2002), 31.

⁵⁴ Donald Rumsfeld, address at the National Defense University at Fort McNair, Washington, DC, 31 January 2002 quoted in Pete Majeranowski, "Knowledge Web Plays Big in Transformation," *U.S. Naval Institute Proceedings*, July 2003, 43.

⁵⁵ Definition of transformation constructed from: Hans Binnendijk. *Transforming America's Military*. (Washington D.C.: National Defense University Press, 2002) and Christopher Ankerson and Losel Tethong. "Rapid Decisive Ops Are Risky Business," *U.S. Naval Institute Proceedings*, October 2003, 52-55.

⁵⁶ Binnendijk, 142.

⁵⁷ Ibid., 107 & 142.

⁵⁸ Harlan K. Ullman and James P. Wade, *Shock and Awe: Achieving Rapid Dominance* (Washington DC:National Defense University Press, 1996). Online version www.ndu.edu/inss/books; accessed 12 April 2003 by Christopher Ankerson and Losel Tethong. Utilized and quoted in Christopher Ankerson and Losel Tethong. "Rapid Decisive Ops Are Risky Business," *U.S. Naval Institute Proceedings*, October 2003), 52-53.

⁵⁹ Constructed from the following sources: Max Boot. "The New American Way of War," *Foreign Affairs* 82, no.4 (July-August 2003): 41-58 and William B. Scott. "Iraq Lesson's Learned," *Aviation Week & Space Technology* , 12 May 2003), 38.

⁶⁰ Harlan K. Ullman and James P. Wade, *Shock and Awe: Achieving Rapid Dominance* (Washington DC:National Defense University Press, 1996). Online version www.ndu.edu/inss/books; accessed 12 April 2003 by Christopher Ankerson and Losel Tethong. Utilized and quoted in Christopher Ankerson and Losel Tethong. "Rapid Decisive Ops Are Risky Business," *U.S. Naval Institute Proceedings* , October 2003, 53.

⁶¹ Brian Hays. "Forward with Fundamentals," *U.S. Naval Institute Proceedings*, October 2003, 62.

⁶² Johanna McGahey. "Flawed Assumptions," *Time*, 07 April 2003, 61. The composite "Powell-Weinberger Doctrine" for the employment of U.S. military combat power is taken from the guidelines as set forth in : Caspar W. Weinberger. "The Uses of Military Power" (remarks prepared for the Honorable Caspar W. Weinberger, Secretary of Defense, to the National Press Club, Washington D.C., on November 28, 1984) and Colin L. Powell. "U.S. Forces: Challenges Ahead," *Foreign Affairs* 71, no. 5(Winter 1992):32-45. The "Powell-Weinberger Doctrine" is routinely cited as the benchmark for the employment of U.S. military power. The "doctrine" provides that when the decision to use U.S. combat force is made, then "decisive means" must be employed and that the military must commit "every ounce of strength" and commit troops in "sufficient numbers...as effectively and resolutely as our strength permits."

⁶³ Leonhard, 118.

⁶⁴ Ibid.

⁶⁵ Ibid.

⁶⁶ Boot, "The New American Way of War," 44.

⁶⁷ Milan Vego. "Learning from Victory," *U.S. Naval Institute Proceedings*, August 2003, 33.

⁶⁸ Mary C. Fitzgerald. "A 'Noncontact, Contact War' : What Iraqi Freedom Showed Russia and China," *Armed Forces Journal*, August 2003, 29.

⁶⁹ Joint Staff, Joint Vision and Transformation Division. *An Evolving Joint Perspective: U.S. Joint Warfare and Crisis Resolution in the 21st Century*. (28 January 2003.): 14

⁷⁰ Discussion of the Strategic Studies Group located at Chief of Naval Operations Strategic Studies Group web page, www.nwc.navy.mil/ssg/ Accessed 03 January 2004.

⁷¹ For an illustrative example of the importance of understanding the contextual origin of the principles of war, see the discussion on the principle of economy of force in Bernard Brodie, "The Worth of Principles of War," Lecture, U.S. Army Command and General Staff College, Fort Leavenworth, KS: 07 March 1957.

⁷² Milan Vego. "New Doctrine Must Be Flexible & Dynamic," *U.S. Naval Institute Proceedings*, May 2003, 75.

⁷³ *Doctrine for Joint Operations*, Joint Publication 3-0 (Washington: U.S. Government Printing Office 10 September 2001), A-1.

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